

DVB Toolbox for Internet Television

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Digital Video Broadcasting



DVB IPTV



DVB C



DVB S
SATELLITE

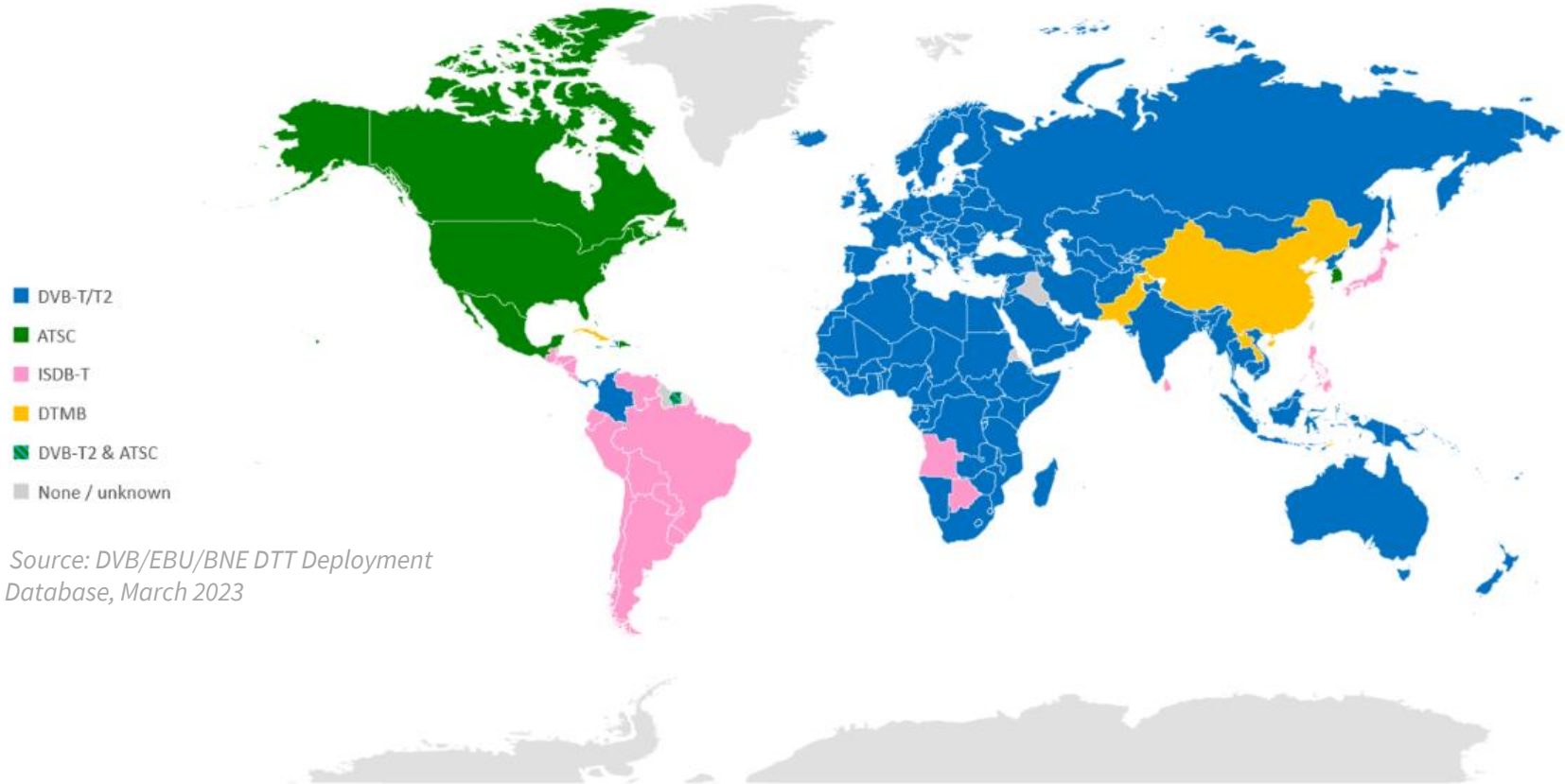


DVB T

MPEG-TS

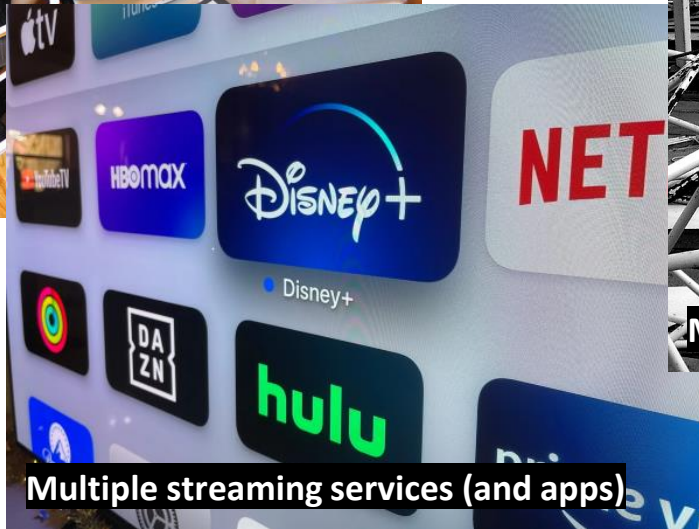
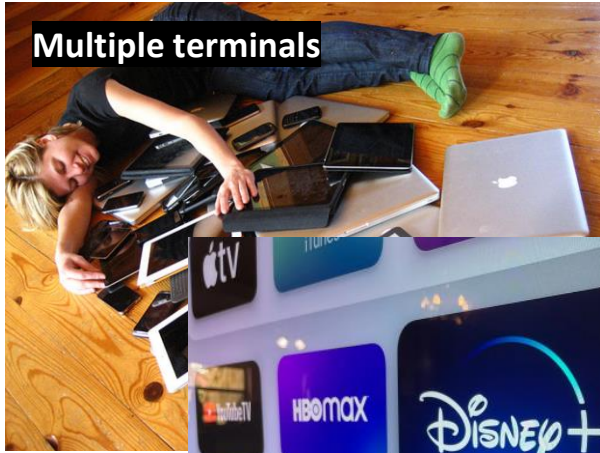


DVB footprint

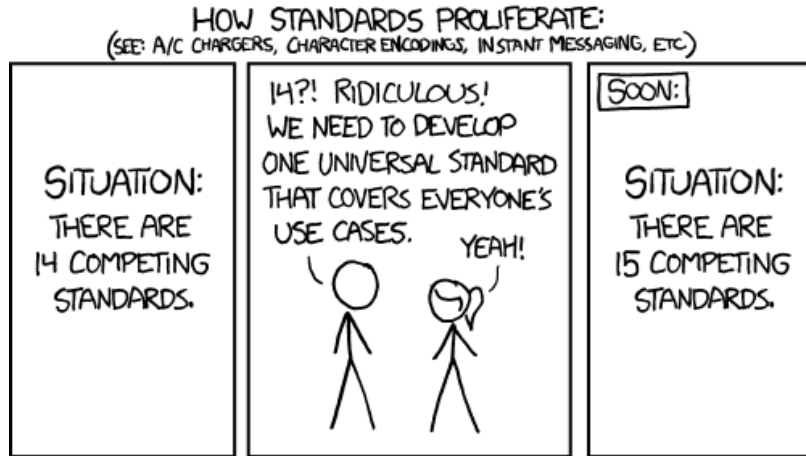


Source: DVB/EBU/BNE DTT Deployment Database, March 2023

Internet Video Streaming



DVB Standardisation strategy for Internet Television



- Reduce number of apps to support
- Keep the TV (zapping) Experience when Moving online
- High quality profiles up to 8K, HDR, Improved device interoperability
- Improve scalability and cost efficiency
- Enable Internet Television over Existing DVB transmission networks

Internet Television by DVB

Interoperability insurance
Strong broadcast ecosystem
Quality of Experience

+



4 Challenges

Discovery of TV services over Internet **DVB-I**[®]

Interoperable Over the Top streaming solution **DVB-DASH**[®]

Scaling and greening the Internet television **DVB-MABR**[®]

Broadcast transformation adopting native IP streaming **DVB-NIP**[®]

DVB-DASH

- DVBs DASH profile standardised in ETSI TS 103 285
- Low Latency support done jointly with DASH-IF (2020)
- In 2023 support for VVC and AVS3 added and AV1 in progress, well defined coding profiles
- Enhancement for live services, Live-to-Vod correct time shift buffers usage, more details on player behaviors
- Improved metadata support for SCTE 35, programme metadata
- Used By HbbTV and DVB-I
- Improved support for Accessibility
- Improved terminal interoperability
- <https://dvb.org/?standard=dvb-mpeg-dash-profile-for-transport-of-iso-bmff-based-dvb-services-over-ip-based-networks>

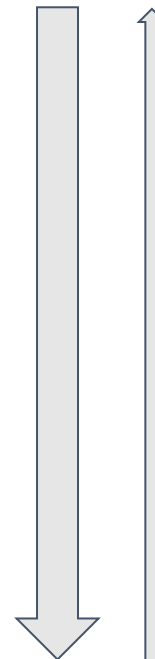
DVB-I Registry



```
<element name="ServiceListEntryPoints" type="dvbisd:ServiceListEntryPointsType"/>
<complexType name="ServiceListEntryPointsType">
  <sequence>
    <element name="ServiceListRegistryEntity" type="dvbisd:OrganizationType"/>
    <element name="ProviderOffering" type="dvbisd:ProviderOfferingType" minOccurs="0"
maxOccurs="unbounded"/>
  ...
```

```
<complexType name="ProviderOfferingType">
  <sequence>
    <element name="Provider" type="dvbisd:OrganizationType"/>
    <element name="ServiceListOffering" type="dvbisd:ServiceListOfferingType"
maxOccurs="unbounded"/>
  ...
```

```
<complexType name="ServiceListOfferingType">
  <sequence>
    <element name="ServiceListName" type="mpeg7:TextualType"
maxOccurs="unbounded"/>
    <element name="ServiceListURI" type="dvbisd:ExtendedURIType"
maxOccurs="unbounded"/>
    <element name="Delivery" type="dvbisd:DeliveryType"/>
  ...
```



GET

- TargetCountry
- regulatorListFlag
- Delivery
- Language
- Genre
- ProviderName
- inlineImages

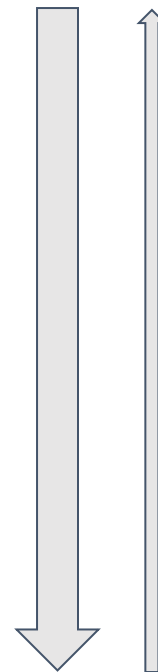
DVB-I service list end-point

```
<complexType name="ServiceType">
  <sequence>
    <element name="UniquelIdentifier" type="dvbisd:ServiceIdentifierType"/>
    <element name="ServiceInstance" type="dvbisd:ServiceInstanceType" minOccurs="0"
maxOccurs="unbounded"/>
    <element name="TargetRegion" type="dvbisd:RegionIdRefType" minOccurs="0"
maxOccurs="unbounded"/>
    <element name="ServiceName" type="mpeg7:TextualType" maxOccurs="unbounded"/>
    <element name="ProviderName" type="mpeg7:TextualType" maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

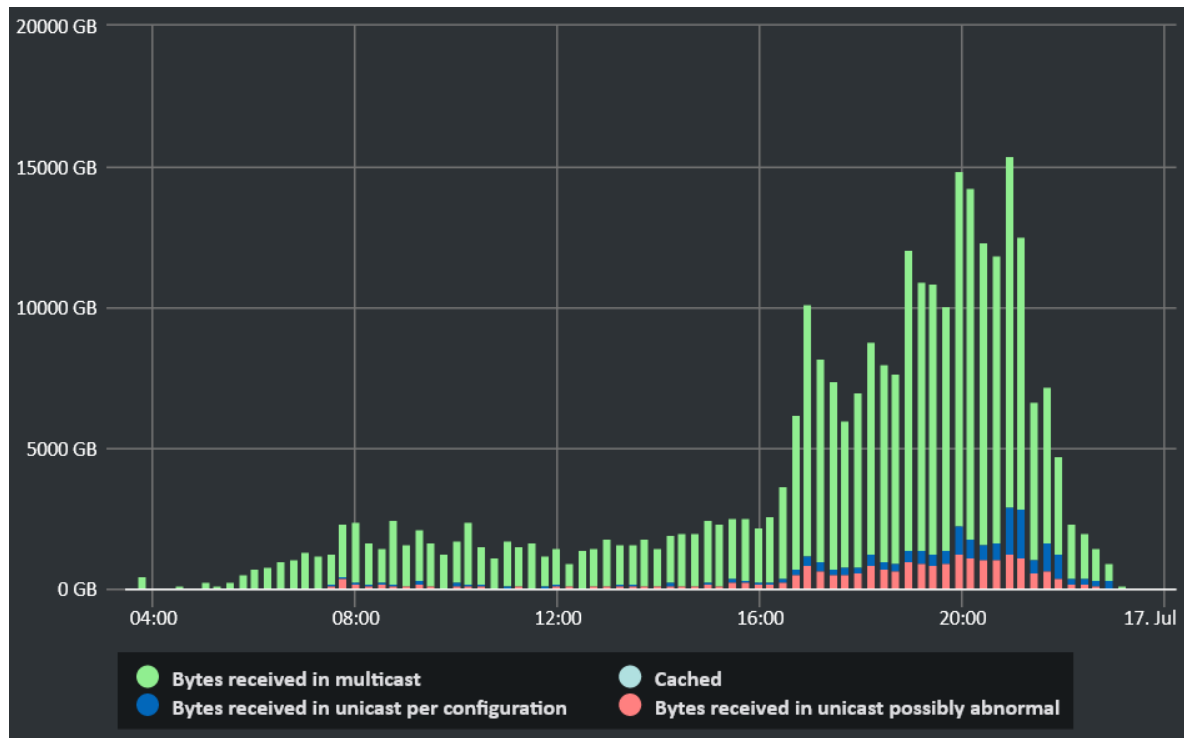
```
<complexType name="ServiceInstanceType">
  <sequence>
    <element name="DisplayName" type="mpeg7:TextualType" minOccurs="0" maxOccurs="unbounded"/>
    .....
    <choice minOccurs="0">
      <sequence>
        <element name="DVBSDeliveryParameters" type="dvbisd:DVBSDeliveryParametersType"/>
        <element name="SATIPDeliveryParameters" type="dvbisd:SATIPDeliveryParametersType"
minOccurs="0"/>
        .....
        <element name="DASHDeliveryParameters" type="dvbisd:DASHDeliveryParametersType"/>
      </sequence>
    </choice>
  </sequence>
</complexType>
```

```
<complexType name="DASHDeliveryParametersType">
  <sequence>
    <element name="UriBasedLocation" type="dvbisd:ExtendedURIType"/>
    <element name="MinimumBitRate" type="unsignedInt" minOccurs="0"/>
    .....
  </sequence>
</complexType>
```

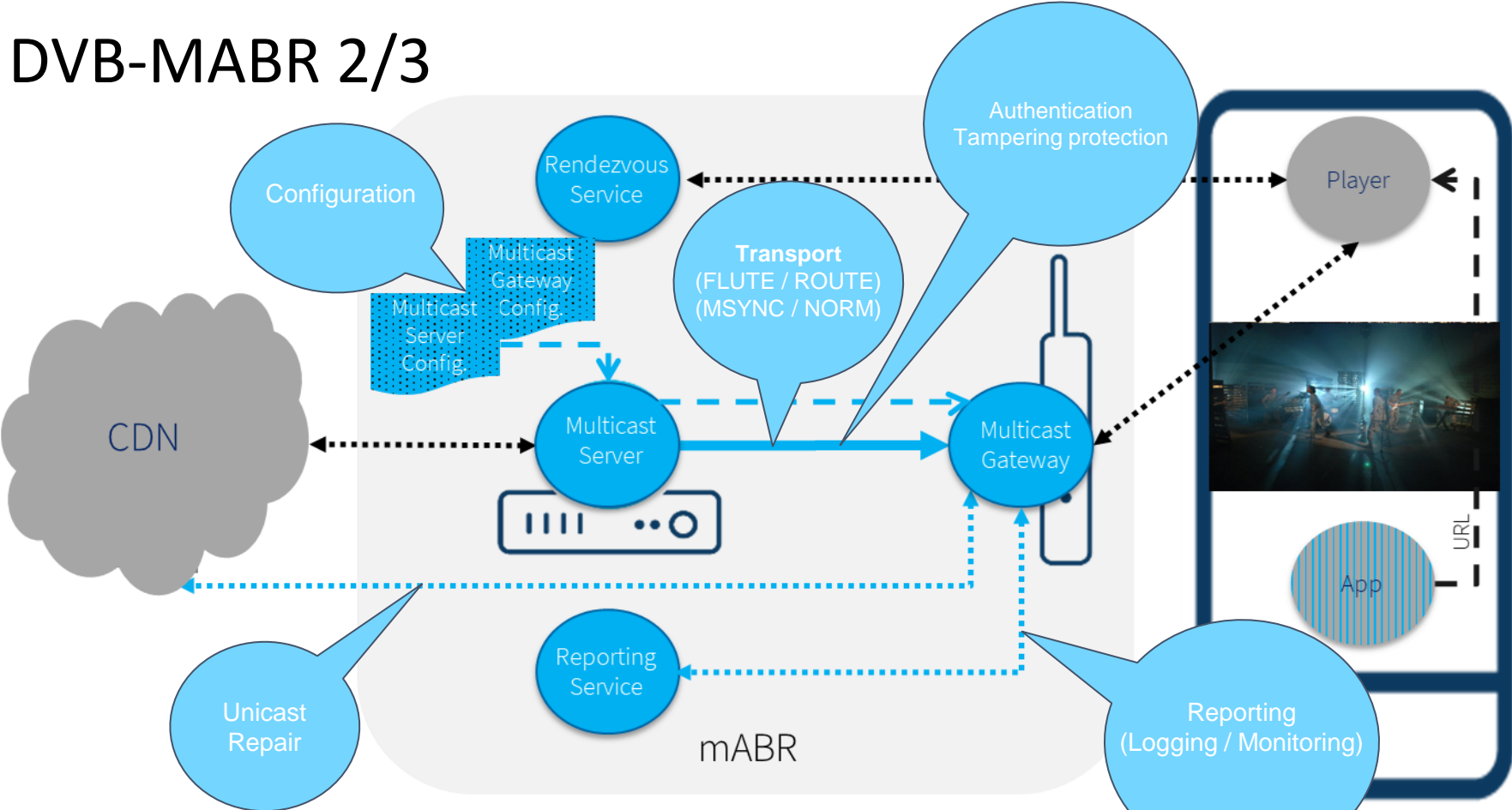
DVB-I service
list server



DVB-MABR 1/3



DVB-MABR 2/3



DVB-MABR 3/3

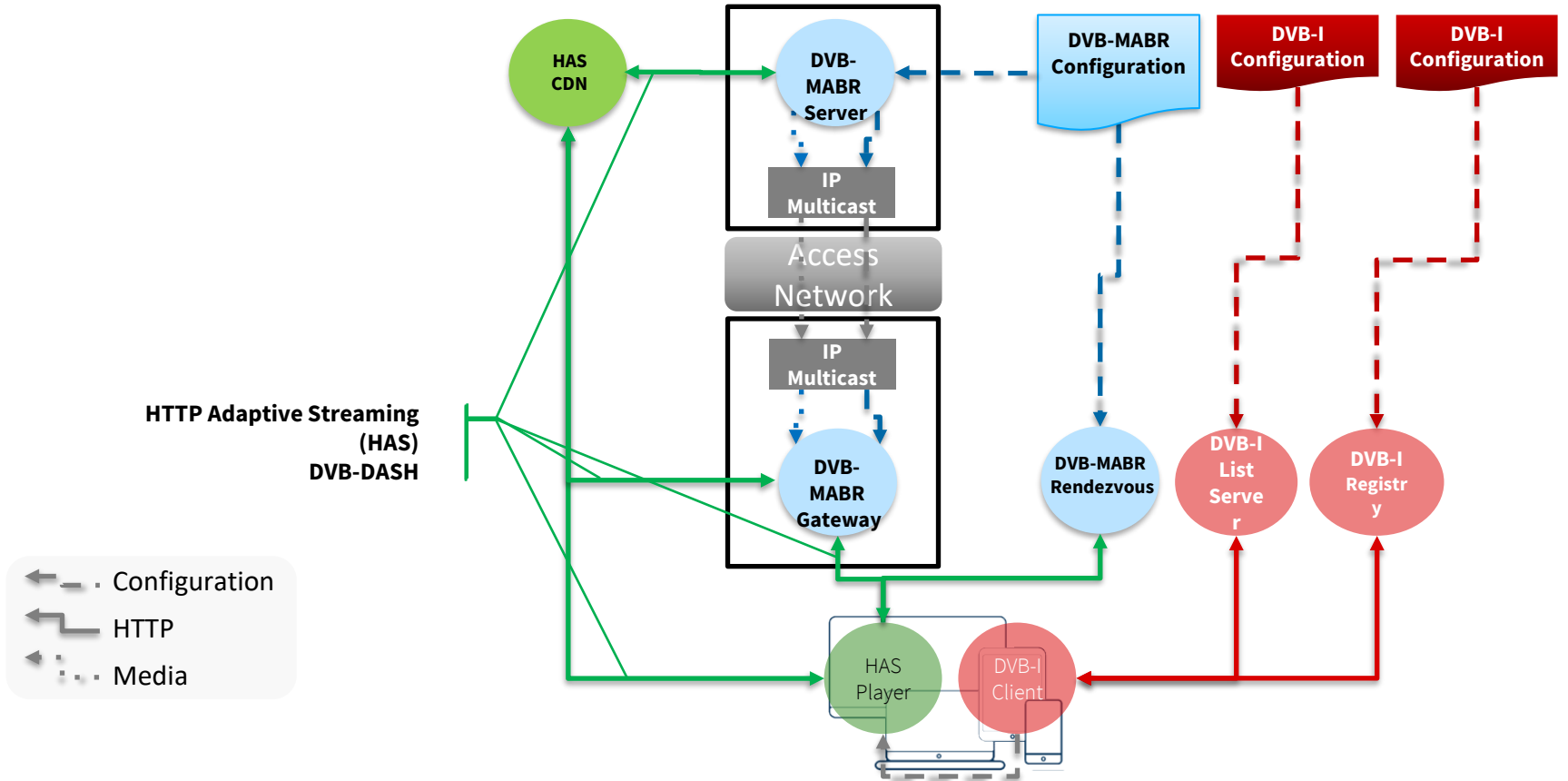
Configuration

- HTTP adaptive streaming representations mapping over multicast UDP/IP sessions
- Ingest URI to transport URI to [unicast] repair URI to request URI mapping
- Bandwidth requirements
- Monitoring and logging

Modes of operation

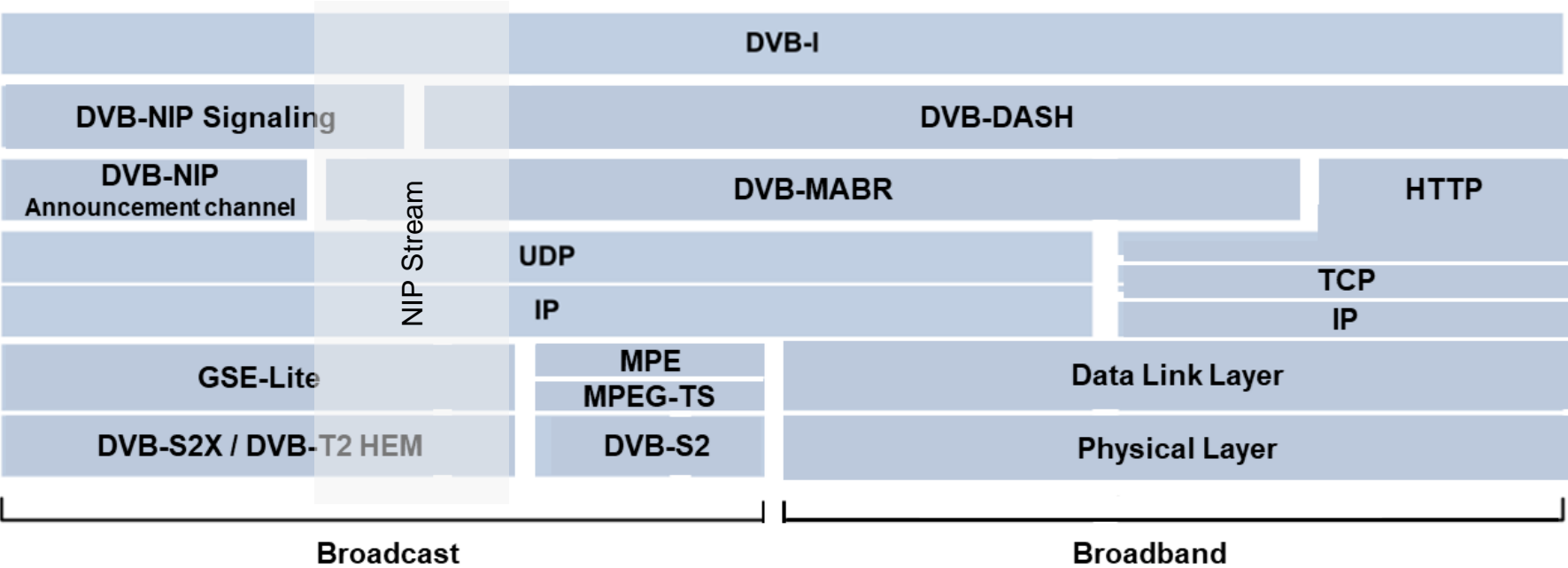
- Configuration
- Content playback
 - Service discovery
 - Rendezvous service
- Unicast repair
- Reporting

Internet Television



← - - - Configuration
 ← - - - HTTP
 ← ···· Media

DVB-NIP



DVB-NIP

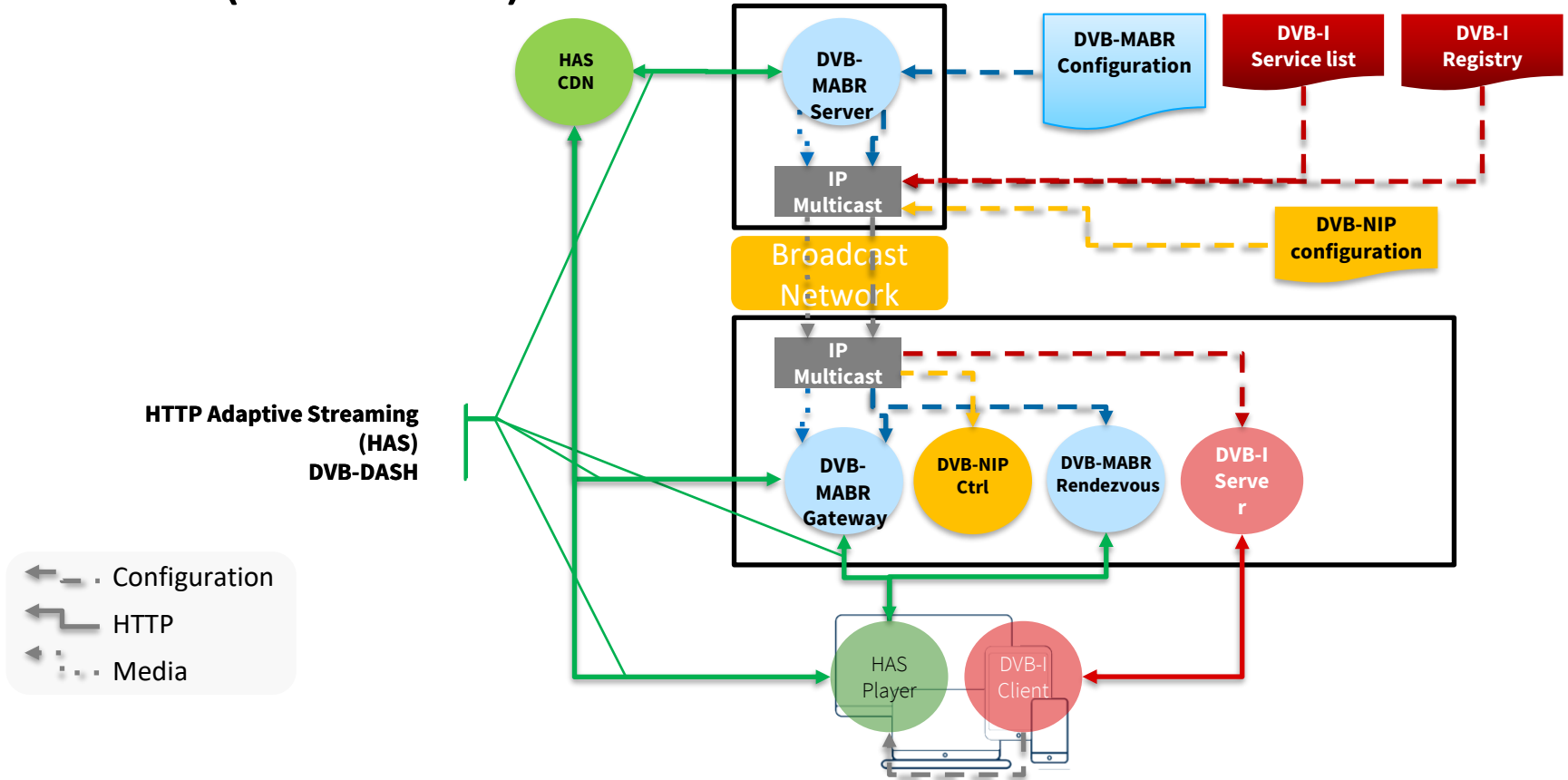
Announcement channel: system signaling files

- Announcement channel
 - A reserved UDP/IP multicast session
- Bootstrap NIP stream (possibly pre-provisioned in the NIP gateway)
 - Network Information File (NIF): physical information to tune to any **NIP stream**
 - Service Information File (SIF): List of URIs corresponding to either a **DVB-I service list** or a **DVB-DASH service** with for each, the corresponding NIF entry (NIP stream)
 - **DVB-I Service List** Entry Points
- Regular NIP stream
 - DVB-I service lists
 - MABR gateway configuration

Modes of operation

- NIP gateway discovery and bootstrapping
- DVB-MABR
- DVB-I

DVB-NIP (Native IP)



Questions



Please Reach out to us if you have interest in this work and the developments

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End

Thank you for your attention